
# 2013 Steering Committee Meeting

## Website/Database Discussion

# MMPC 2012 Steering Committee meeting

1) Overview of website activities

2) Review of current data in the system

3) Website changes

MMPC
National Mouse Metabolic Phenotyping Centers

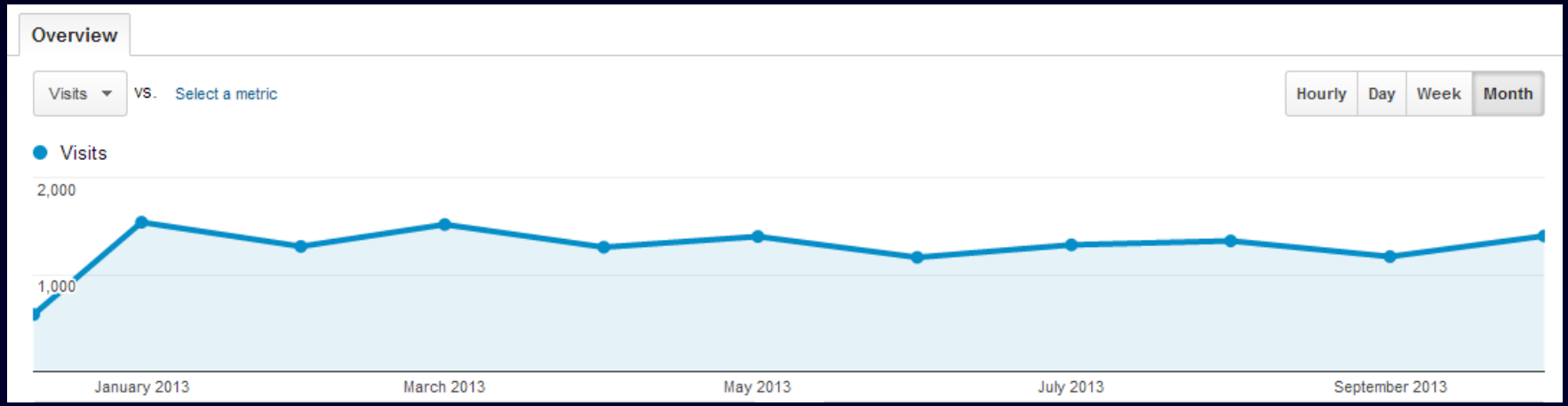
# Website Overview

Total number of visits: 14,020

Average number of visitors: 1,343 per month
309 per week

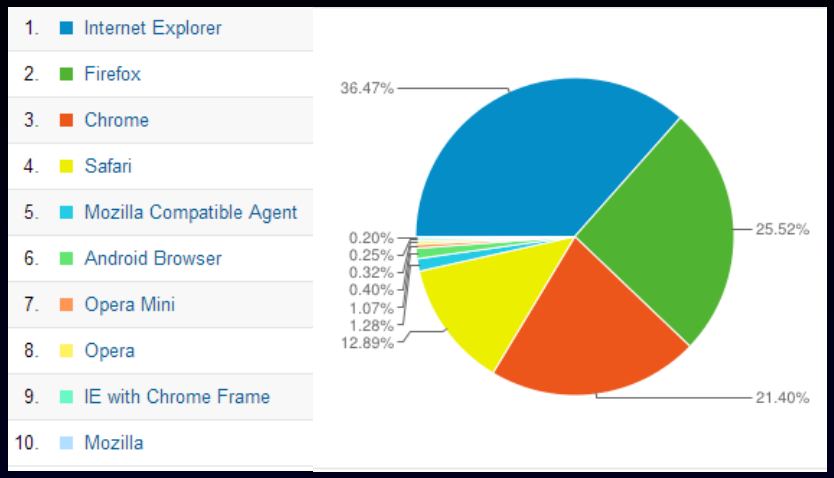
Pages/Visit: 4.21

Average Time/Visit: 3:27

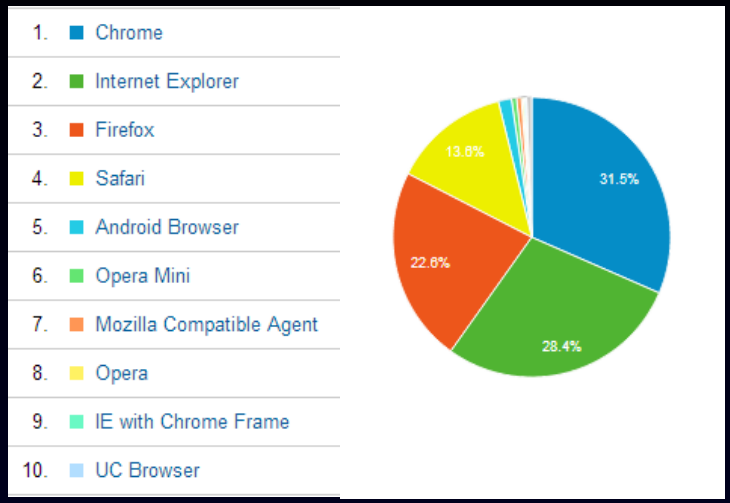



MMPC
National Mouse Metabolic Phenotyping Centers

# BROWSERS



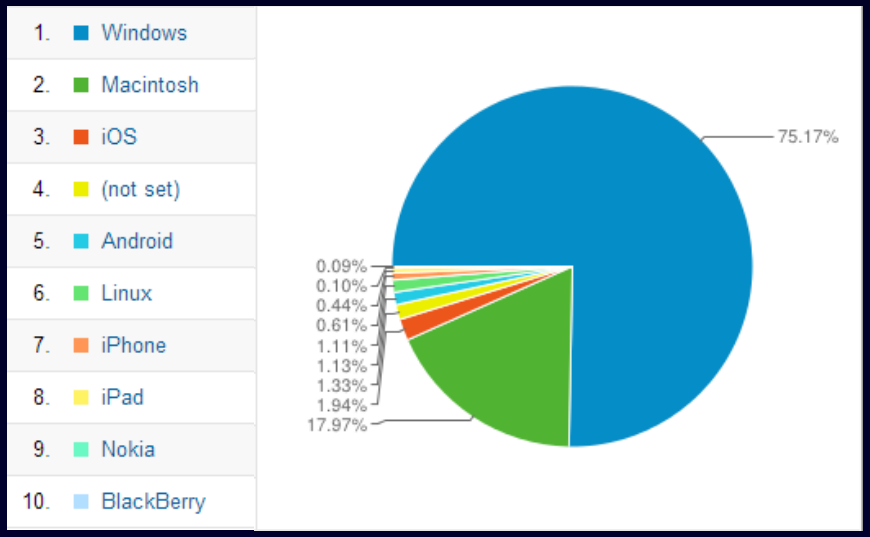

2012



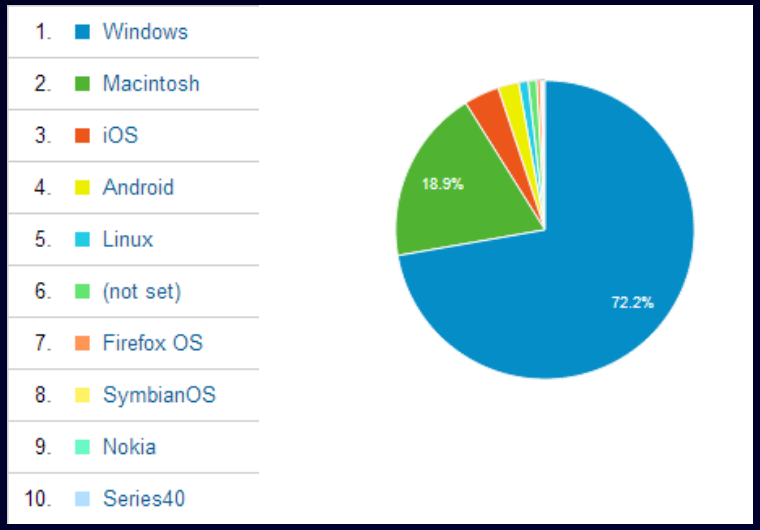

2013

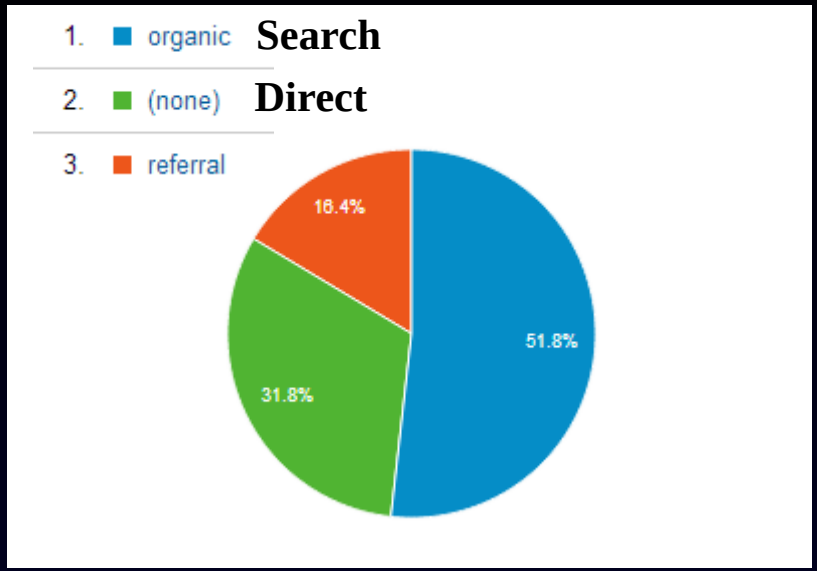
# OPERATING SYSTEMS

2012




2013

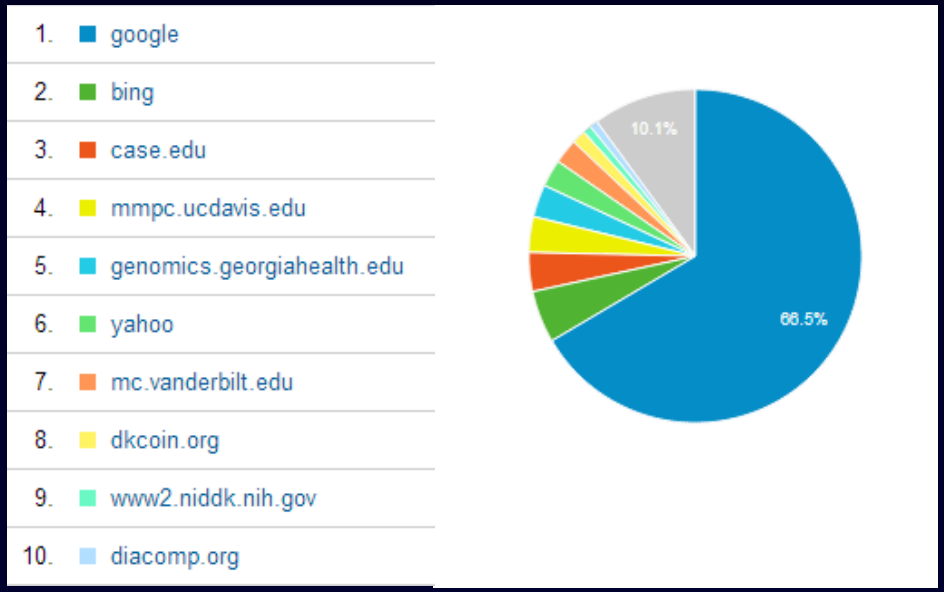





**Search**

**Direct**

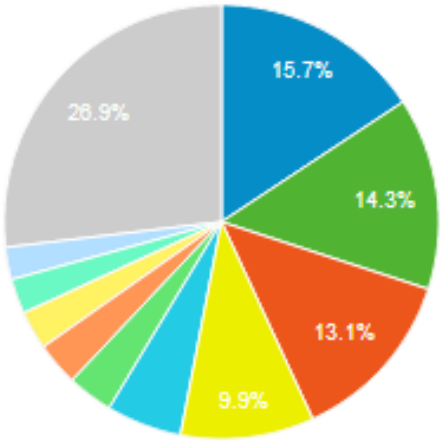
## SEARCH ENGINES




MMPC
National Mouse Metabolic Phenotyping Centers

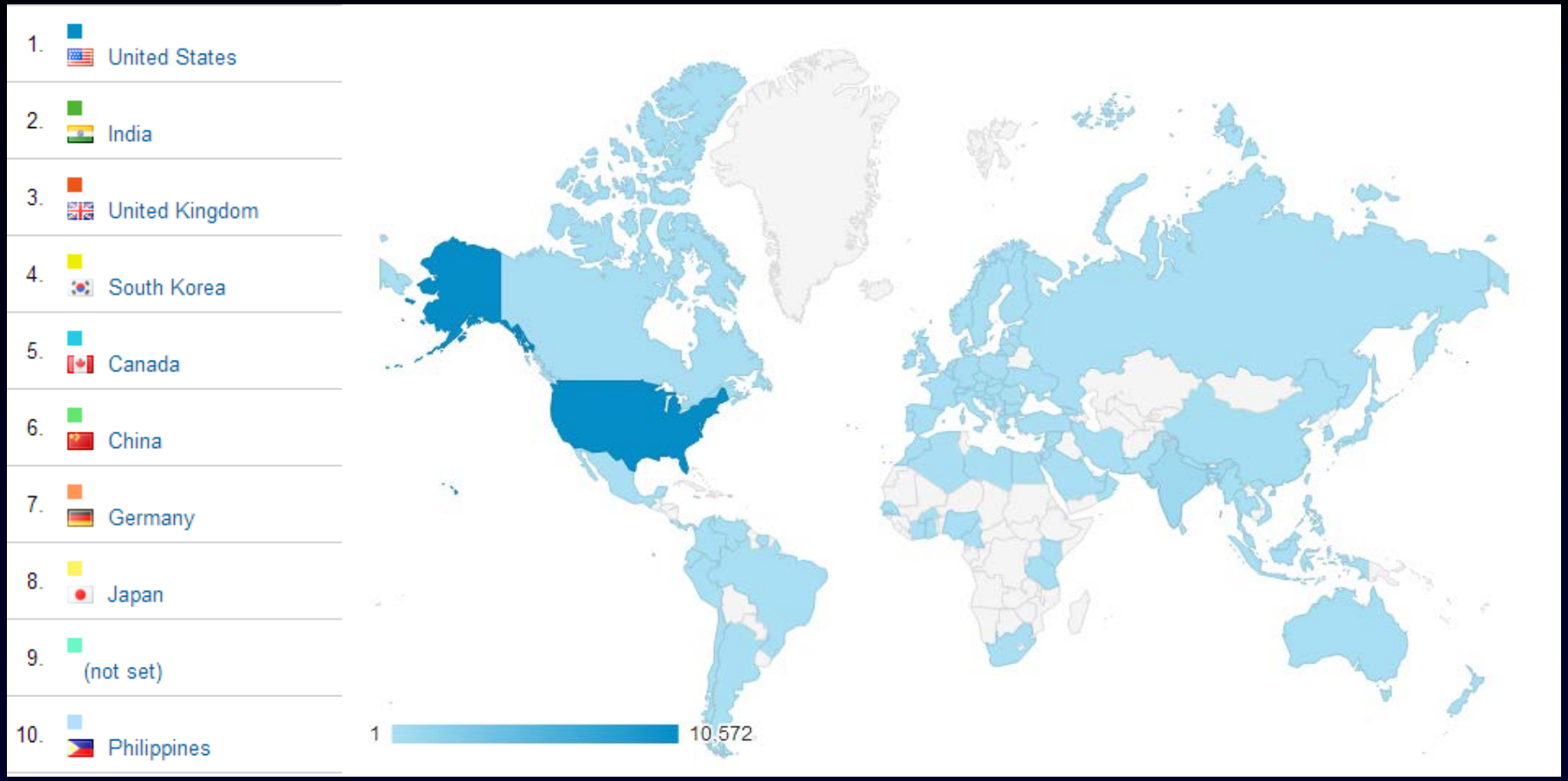
# REFERRING SITES

1. case.edu
2. mmpc.ucdavis.edu
3. genomics.georgiahealth.edu
4. mc.vanderbilt.edu
5. dkcoin.org
6. www2.niddk.nih.gov
7. diacomp.org
8. nih.gov
9. search.mywebsearch.com
10. mousephenotype.uc.edu




MMPC
National Mouse Metabolic Phenotyping Centers

# Where are the visitors coming from?




75 % USA

100 Countries/Territories
1976 Cities

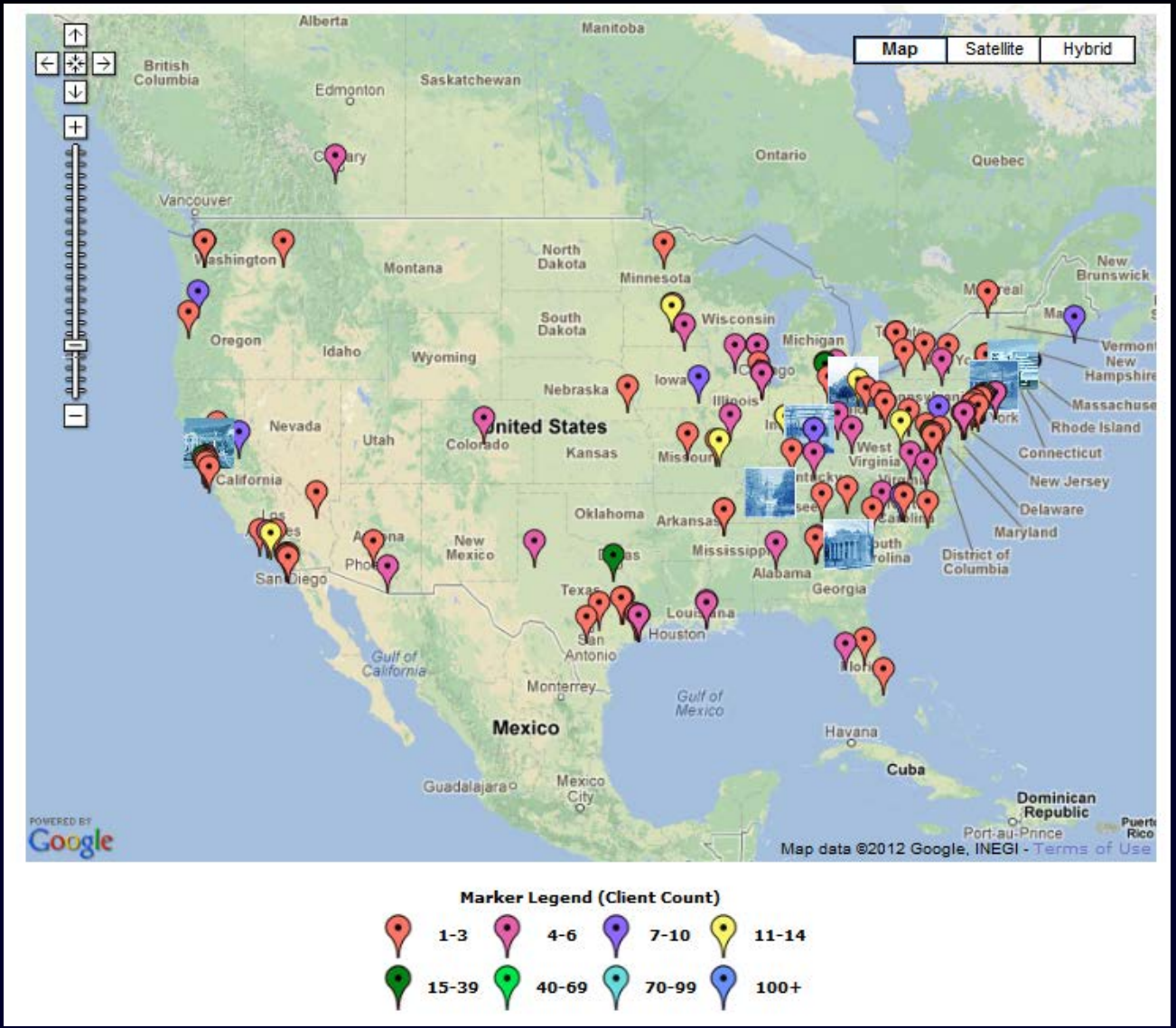
MMPC
National Mouse Metabolic Phenotyping Centers

What are the visitors viewing?

1. Catalog Pages
2. Courses Page
3. Order Page
    1. Application For Services page
4. Funding Page
5. Policies/Animal Shipping pages
6. Publications
7. Protocols

MMPC
National Mouse Metabolic Phenotyping Centers

# Current Year: 323 Orders Entered (26% increase over last year)




MMPC
National Mouse Metabolic Phenotyping Centers

# Data Entry – Current Year

Data Upload Award

Determined RANK for each of four parameters and sum across for upload score.

Parameters: Experiments, Assays, Measurements, Animals.

AND THE WINNER IS……

## University of Massachusetts

MMPC
National Mouse Metabolic Phenotyping Centers

# Center Core Order Statistics

Refresh

| Center Core | Orders Pending | Orders Accepted | Orders Completed | Orders Rejected |
|---|---|---|---|---|
| **Center: Case Western Reserve University; Items: 2** | | | | |
| Analytical Core | 6 | 0 | 33 | 0 |
| Metabolic Core | 4 | 0 | 15 | 0 |
| **Center: University of California Davis; Items: 4** | | | | |
| Animal Care Core | 0 | 0 | 1 | 0 |
| Metabolism and Endocrinology Core | 6 | 4 | 9 | 0 |
| Body Composition, Thermoregulation, and Food Intake Behavior Core | 2 | 2 | 13 | 0 |
| Cardiovascular Biology and Pathology Core | 1 | 0 | 0 | 0 |
| **Center: University of Cincinnati Medical Center; Items: 1** | | | | |
| Lipid, Lipoprotein and Glucose Metabolism Core | 11 | 1 | 29 | 0 |
| **Center: University of Massachusetts Medical School; Items: 2** | | | | |
| Metabolism Core | 0 | 11 | 11 | 7 |
| Analytical Core | 0 | 6 | 15 | 4 |
| **Center: Vanderbilt University School of Medicine; Items: 3** | | | | |
| Metabolic Pathophysiology Core | 4 | 4 | 13 | 0 |
| Cardiovascular Pathophysiology & Complications Core | 0 | 1 | 4 | 0 |
| Analytical Resources Core | 7 | 1 | 13 | 1 |
| **Center: Yale University School of Medicine; Items: 3** | | | | |
| In Vivo Metabolism Core | 8 | 0 | 1 | 0 |
| Analytical Core | 48 | 0 | 45 | 0 |
| Metabolism and Endocrinology Core | 1 | 0 | 0 | 0 |

MMPC
National Mouse Metabolic Phenotyping Centers

# Website Updates

MMPC
National Mouse Metabolic Phenotyping Centers

## Welcome to the National Mouse Metabolic Phenotyping Centers

**The MMPC is a National Institutes of Health-sponsored resource that provides experimental testing services to scientists studying diabetes, obesity, diabetic complications, and other metabolic diseases in mice.**

### MMPC Centers

**Georgia Regents University**
Coordinating and Bioinformatics unit
DIRECTOR: Richard McIndoe, Ph.D.
EMAIL: DIRECTOR | GENERAL CONTACT
NIDDK Grant: DK076169

**Case Western Reserve University**
DIRECTOR: Henri Brunengraber, M.D., Ph.D.
EMAIL: DIRECTOR | GENERAL CONTACT
NIDDK Grant #: DK076174

**University of California Davis**
DIRECTOR: K.C. Kent Lloyd, DVM, Ph.D.
EMAIL: DIRECTOR | GENERAL CONTACT
NIDDK Grant #: DK092993

**University of Cincinnati Medical Center**
DIRECTOR: Patrick Tso, Ph.D.
EMAIL: DIRECTOR | GENERAL CONTACT
NIDDK Grant #: DK059630

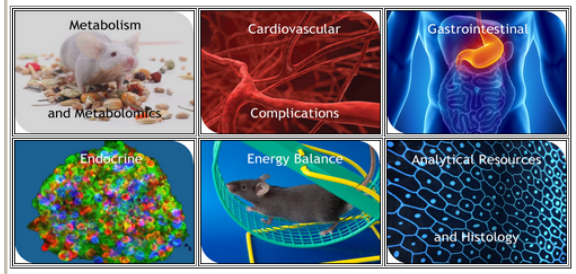
**University of Massachusetts Medical School**
DIRECTOR: Jason Kim, Ph.D.
EMAIL: DIRECTOR | GENERAL CONTACT
NIDDK Grant #: DK093000

**Vanderbilt University School of Medicine**
DIRECTOR: David Wasserman, Ph.D.
EMAIL: DIRECTOR | GENERAL CONTACT
NIDDK Grant #: DK059637

**Yale University School of Medicine**
DIRECTOR: Gerald Shulman, M.D., Ph.D.
EMAIL: DIRECTOR | GENERAL CONTACT
NIDDK Grant #: DK059635

### Interested in getting a test completed?

*Select a test group below to continue*




To begin the order process please click one of the test groups above. Please read the MMPC Guidelines and Policies before submitting an online Application for Services.

Shipping mice to an MMPC will require a Mouse / Tissue Transfer Agreement form.

### What's New?

**The MMPC Energy Expenditure analysis page uses multiple linear regression analysis to assess the impact of covariates (e.g. Mass) on energy expenditure. Click here to perform a linear regression analysis**

### New Publications

Regulation of endogenous glucose production in glucose transporter 4 over-expressing mice
Authors: Berglund ED, Li CY, Ayala JE, McGuinness OP, Wasserman DH

AMP-activated protein kinase (AMPK)a2 plays a role in determining the cellular fate of glucose in insulin-resistant mouse skeletal muscle
Authors: Lee-Young RS, Bonner JS, Mayes WH, Iwueke I, Barrick BA, Hasenour CM, Kang L, Wasserman DH

Muscle-specific vascular endothelial growth factor deletion induces muscle capillary rarefaction creating muscle insulin resistance
Authors: Bonner JS, Lantier L, Hasenour CM, James FD, Bracy DP, Wasserman DH

Inhibition of Cisplatin-induced lipid catabolism and weight loss by ghrelin in male mice.
Authors: Garcia JM, Scherer T, Chen JA, Guillory B, Nassif A, Papusha V, Smiechowska J, Asnicar M, Buettner C, Smith RG

Relaxin treatment reverses insulin resistance in mice fed a high-fat diet.
Authors: Bonner JS, Lantier L, Hocking KM, Kang L, Owolabi M, James FD, Bracy DP, Brophy CM, Wasserman DH

All Publications

### Video Publications

Hyperinsulinemic-euglycemic Clamps in Conscious, Unrestrained Mice
Authors: Julio E. Ayala, Deanna P. Bracy, Carlo Malabanan, Freyja D. James, Tasneem Ansari, Patrick T. Fueger, Owen P. McGuinness, David H. Wasserman

dkCOIN NIDDK COnsortium Interconnectivity Network
Beta Cell Biology Consortium
DIABETES RESEARCH CENTERS
UCDAVIS KOMP Repository KNOCKOUT MOUSE PROJECT
DiaComp
NIH National Heart, Lung, and Blood Institute
NIH National Institute of Diabetes and Digestive and Kidney Diseases
JDRF IMPROVING LIVES. CURING TYPE 1 DIABETES.

Back to Top



MMPC National Mouse Metabolic Phenotyping Centers

MMPC
National Mouse Metabolic Phenotyping Centers

Google™ Custom Search Search

Home | Contact | About MMPC | Animal Husbandry | Tests | Data Search | Data Analysis | Clients

- Measurement Category
- Protocols
- Orders
- Strains
- Assays
- Expert Search
- dkCOIN Resources

## Welcome to the National Mouse Metabolic Phenotyping Centers

**The MMPC is a National Institutes of Health-sponsored resource tha l testing services to scientists studying diabetes, obesity, diabetic complicatio diseases in mice.**

### MMPC Centers

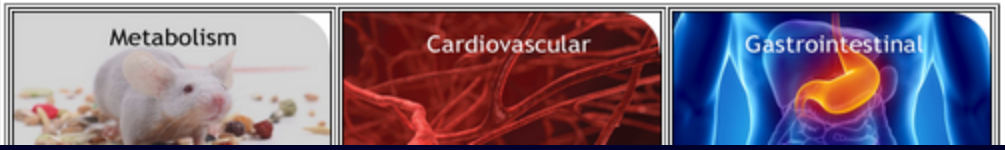
Georgia Regents University
Coordinating and Bioinformatics unit

DIRECTOR: Richard McIndoe, Ph.D.
EMAIL: DIRECTOR | GENERAL CONTACT
NIDDK Grant: DK076169

Case Western Reserve University

### Interested in getti

*Select a test group below to continue*




Regulation of glucose trans
Authors: Be McGuinness C

AMP-activate role in deter insulin-resist

MMPC
National Mouse Metabolic Phenotyping Centers

# Catalog Updates


~51% of Catalog Visits Use this Interface

Rank Order of Page Views:

1. Metabolism and Metabolomics
2. Cardiovascular Complications
3. Gastrointestinal
4. Energy Balance
5. Analytical Resources/Histology
6. Endocrine

NOTE: 3-6 above are not statistically different.

MMPC
National Mouse Metabolic Phenotyping Centers

## MMPC Test Selection

Welcome to the MMPC Order / Test Selection interface. Please use the filter options on the left to filter by Center, Center Core(s), Test Group(s), Research Area(s), and/or Keyword(s). To filter Center, click the Center Name (this will update the Center Core Options specific to the selected center). To filter by Center Core, Test Group, and/or Research Area select the checkboxes next to each item. To search by Keyword begin typing a keyword in the search box provided, then click on the keyword to add it to the list box below the search. When filter options are complete click the 'Search' button.

Select the needed tests in the right side of the page. Once all the needed tests are selected click the 'Create Order' button. This page will automatically redirect to the login page if you are not logged in. Once you have logged in, it will then redirect to the Create Order page with your selected Tests and Centers pre-filled in.

**PLEASE NOTE:**Tests can only be ordered from one MMPC Center at a time. The following is a catalog containing all tests offered by the MMPC.

Optionally the catalog can be downloaded in PDF format: DOWNLOAD AS *.PDF

### Catalog Items Available (with filter): 331

- Centers
- Center Cores
- Test Groups
- Research Areas

Show Keyword Search

*Type to search for tissues and add it to the list.*

Remove

Clear

| Select | Test Number | Test Name |
|---|---|---|
| **Center: Case Western Reserve University** | | |
| **Core: Analytical Core** | | |
| ☐ | CA2022 | 13C-Labeling pattern of acetyl moiety of citrate (substrate oxidation) *Price: $175/sample* |
| ☐ | CA2044 | Brain uptake and blood flow *Price: Inquire* |
| ☐ | CA2053B | Custom Designed Biological Experiment *Price: Inquire* |
| ☐ | CA2024CT | Custom Designed Tracer Experiment *Price: $200.00/sample* |
| ☐ | CA2050 | Data summary Interpretation *Price: Inquire* |
| ☐ | CA2051 | Excise Tissues, Blood Serum/Plasma *Price: $30.00/mouse* |
| ☐ | CA2016 | Fatty acid and/or cholesterol synthesis using 2H-labeled water *Price: $150.00/sample* |
| ☐ | CA2056 | Housing mice 1 to 14 days *Price: Inquire* |
| ☐ | CA2046 | Indirect Calorimetry *Price: $60.00/mouse* |

Search Reset

Create Order

Back to Top

## MMPC Test Selection

Welcome to the MMPC Order / Test Selection interface. Please use the filter options on the left to filter by Center, Center Core(s), Test Group(s), Research Area(s), and/or Keyword(s). To filter Center, click the Center Name (this will update the Center Core Options specific to the selected center). To filter by Center Core, Test Group, and/or Research Area select the checkboxes next to each item. To search by Keyword begin typing a keyword in the search box provided, then click on the keyword to add it to the list box below the search. When filter options are complete click the 'Search' button.

Select the needed tests in the right side of the page. Once all the needed tests are selected click the 'Create Order' button. This page will automatically redirect to the login page if you are not logged in. Once you have logged in, it will then redirect to the Create Order page with your selected Tests and Centers pre-filled in.

**PLEASE NOTE:**Tests can only be ordered from one MMPC Center at a time. The following is a catalog containing all tests offered by the MMPC.

Optionally the catalog can be downloaded in PDF format: DOWNLOAD AS *.PDF

### Catalog Items Available (with filter): 24

- Centers
  - Case Western Reserve University
  - University of California Davis
  - University of Cincinnati Medical Center
  - University of Massachusetts Medical School
  - Vanderbilt University School of Medicine
  - Yale University School of Medicine
- Center Cores
- Test Groups
  - Analytical Resources & Histology
  - Cardiovascular
  - Endocrine
  - Energy Balance
  - Gastrointestinal
  - Metabolism
- Research Areas

Show Keyword Search

Show Tissue Search

| Select | Test Number | Test Name |
|---|---|---|
| **Center: University of California Davis** | | |
| **Core: Body Composition, Thermoregulation, and Food Intake Behavior Core** | | |
| ☐ | D4002 | Adiposity (adipose depot weights) *Price: $20.00/mouse* |
| ☐ | D4009 | Brown Adipose Tissue Thermogenic Activation *Price: $100.00/mouse* |
| ☐ | D4005 | Digestible Energy *Price: $150.00/mouse* |
| ☐ | D4007 | Energy Expenditure (CLAMS, Indirect Calorimetry) *Price: $124.00/mouse (minimum of 8 mice)* |
| ☐ | D4001 | Gross Body Composition *Price: $20.00/mouse* |
| **Core: Metabolism and Endocrinology Core** | | |
| ☐ | D3204 | Adipocyte metabolism/hormone production - adiponectin secretion at 96 hour *Price: $26.00* |
| ☐ | D3201 | Adipocyte metabolism/hormone production - Isolation/cell size/# *Price: $50.00* |
| ☐ | D3203 | Adipocyte metabolism/hormone production - leptin secretion at 96 hour *Price: $12.00* |
| ☐ | D3437 | Adiponectin (HMW) |

Search Reset

Create Order

Back to Top

# Protocol Updates

1. Worked on getting Center protocols in the system for the catalog items.

2. Four of six centers have submitted protocols to be uploaded into the National MMPC website.

    a. University of Massachusetts – 57 protocols
    b. University of California Davis – 51 protocols
    c. Yale University - 19 protocols
    d. University of Cincinnati - 8 protocols

MMPC
National Mouse Metabolic Phenotyping Centers

# Protocol Template



## Basal glucose metabolism

Version: 1
Edited by: Jason Kim

*(note that the following list should be linked to the appropriate location.)*



## Summary: *(This area will include a brief description of what the protocol is used for and why someone would need to use it.)*

Whole body glucose turnover and hepatic glucose production rates are measured at basal state using an intravenous infusion of labeled glucose in awake mice. Whole body glucose turnover and hepatic glucose production regulate basal glucose levels and are altered in obesity.

## Reagents and Materials: *(This should be a comprehensive list of stock solutions and material. The reagent list for the stock solutions is included in the reagent preparation area that is included at the end of this SOP.)*

| Reagent/Material | Vendor | Stock Number |
|---|---|---|
| [3-$^{3}$H] D-glucose | Perkin Elmer | NET331C005MC |
| 0.9 % Sodium Chloride, Injection, USP | B.Braun Medical Inc | NDC0264-4001-55 |
| Pentobarbital | Oak Pharmaceuticals, Inc. | NDC76478-501-50 |
| Barium hydroxide mono- | Sigma | P4050 |

- U Cinn - Body Composition & Carcass Analysis
- U Cinn - Cholesterol Concentration
- U Cinn - Energy Expenditure Measurements
- U Cinn - Meal Pattern Analysis Food Intake Procedure
- U Cinn - NEFA Concentration
- U Cinn - Non-invasive Measurement of Intestinal Fat Absorption
- U Cinn - Phospholipids Assay
- U Cinn - Triglyceride Assay
- U Mass - Acute lipid infusion
- U Mass - Adiponectin
- U Mass - Alanine Transferase
- U Mass - Albumin
- U Mass - Alkaline Phosphatase
- U Mass - Ammonia
- U Mass - Amylase
- U Mass - Aspartate Transferase
- U Mass - Basal glucose metabolism
- U Mass - Bilirubin
- U Mass - Body composition (organs)
- U Mass - Body composition (whole body)
- U Mass - C-Peptide
- U Mass - C-reactive Peptide
- U Mass - Cholesterol (HDL)
- U Mass - Cholesterol (LDL)
- U Mass - Cholesterol (Total)
- U Mass - Chronic drug delivery
- U Mass - Chronic high-fat feeding
- U Mass - Chronic/acute phloridzin treatment
- U Mass - Creatine Kinase
- U Mass - Creatinine
- U Mass - Cytokines Panel I - multiplex
- U Mass - Cytokines Panel II - multiplex
- U Mass - Cytokines Panel III - multiplex
- U Mass - Electrolytes
- U Mass - Energy balance – food intake, energy expenditure, physical activity

MMPC
National Mouse Metabolic Phenotyping Centers

Google™ Custom Search Search

Home | Contact | About MMPC | Animal Husbandry | Tests | Data Search | Data Analysis | Clients

## Catalog Item

Catalog

# Adiponectin

| | |
|---|---|
| **Center** | University of Massachusetts Medical School |
| **Center Core** | Analytical Core |
| **Test No.** | M2008 |
| **Test Price** | $15 (Academic) $12 (UMass) $30 (Industry) *Inquire about lower rates for multiple hormones (Multiplex) and minimum sample number |
| **Description** | Adiponectin is an adipocyte-derived hormone that affects multiple systems in our body including metabolism, vascular biology, and inflammation. Plasma adiponectin concentrations are measured using Bio-Plex 200 Luminex System. |
| **Data** | Data has been collected for this catalog item |
| **Keywords** | adipokine, hormone, insulin resistance, lipids |

CATALOG GROUPS

| Name | Options |
|---|---|
| Hormone Measurements | |
| Insulin and Insulin Function | |
| Endocrine Deficiency | |
| Analytical Resources and Histology | |

PHENOTYPE ASSAYS

| Name | Abbreviation | Options |
|---|---|---|
| adiponectin | *None* | |

PROTOCOLS

| Title | Type | Version | Investigator(s) | Options |
|---|---|---|---|---|
| U Mass - Adiponectin | Phenotype Assay | 1 | | |

Back to Top

MMPC
National Mouse Metabolic Phenotyping Centers

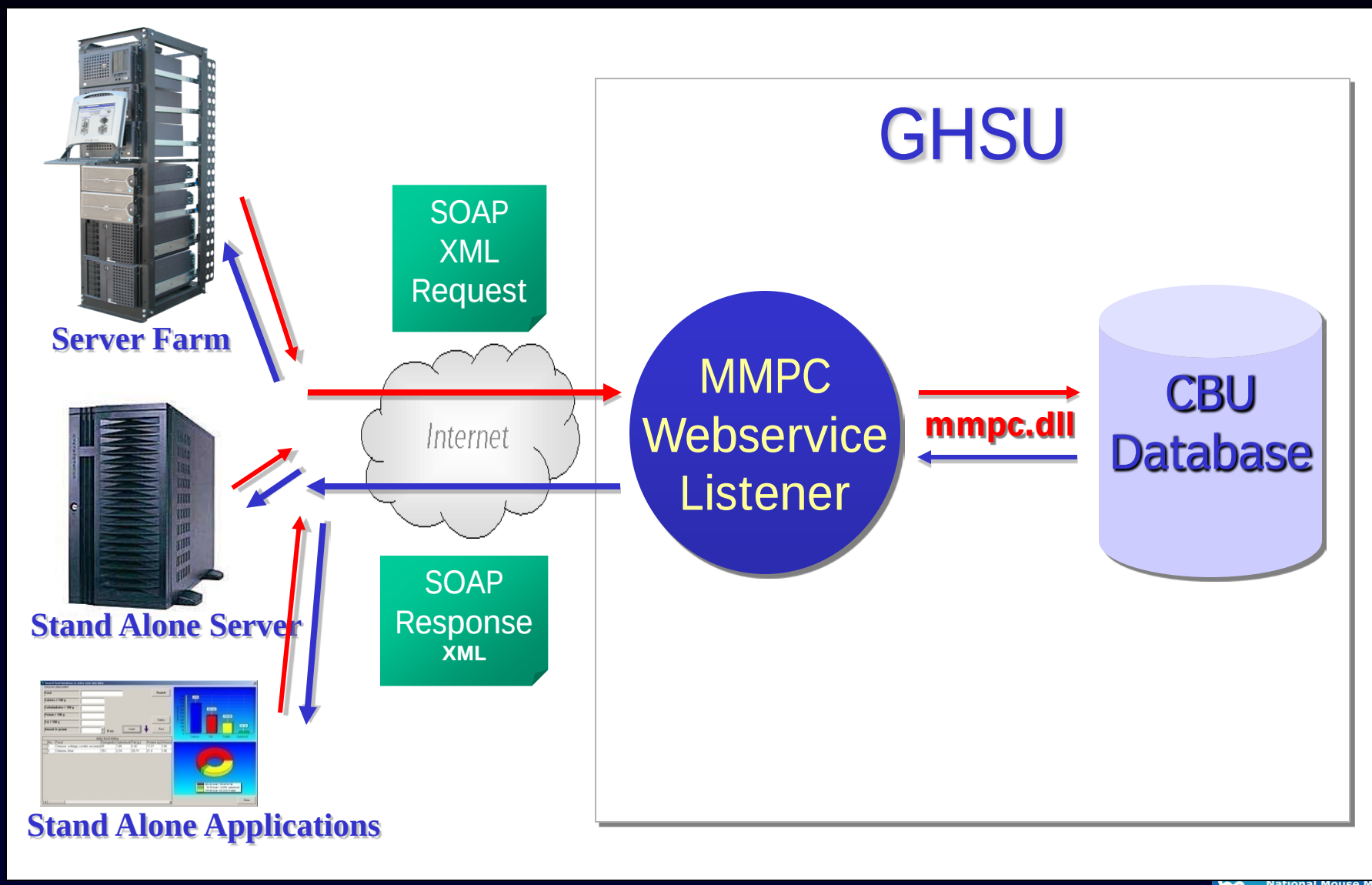
# MMPC Web Services

# Account Creation/Login, Order Management

MMPC
National Mouse Metabolic Phenotyping Centers

# MMPC Web Services – Account Creation/Login, Order Management

Provide programmatic service for other platforms to access data using SOAP/HTTP



# MMPC Web Services

The web services allow centers to create custom user interfaces based on their website look and feel for client account creation and log in and order creation and edit.

Created Two types of web services:  Secure and Shared

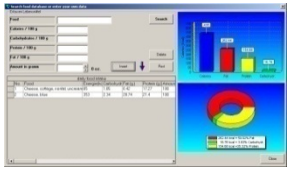
The web services have different methods to accomplish client/order creation/edit.

To maintain MMPC policies and security, each center will be assigned a Center GUID (e.g. UC Davis GUID = b75fe2ba-d1de-4d05-83c6-6a2d1290fef5)

MMPC
National Mouse Metabolic Phenotyping Centers

Server Farm

Stand Alone Server



Stand Alone Applications

Center GUID
Username
Password

Internet

Security Token GUID
Timeout = 2 hr
Associated with
Member and Center

GHSU

MMPC Webservice Listener

mmpc.dll

CBU Database

MMPC
National Mouse Metabolic Phenotyping Centers

* ALL LINKS POINT TO DEV *

SECURE METHODS

| DEPRECATED METHOD | REPLACEMENT METHOD |
|---|---|
| CreateOrder | AddOrder<br>EditOrder |
| GetCatalogData<br>GetCatalogItemNames<br>GetCatalogItemPrices<br>GetCatalogNumbersAndNames | CatalogWebService |
| UpdateMember | UpdateProfile |

SECURE METHODS

* ALL LINKS POINT TO DEV *

* ALL LINKS POINT TO DEV *

SHARED METHODS

| DEPRECATED METHOD | REPLACEMENT METHOD |
|---|---|
| CreateAccount | CreateProfile |
| GetBackcrossHistories<br>GetBackcrossHistoryIDs | GetBackcrossHistoryList |
| GetBackgroundStrainIDs<br>GetBackgroundStrains | GetBackgroundStrainList |
| GetCatalogAttributes | CatalogWebService |
| GetCenters* (Shared.asmx) | GetCenterList<br>**GetCenters** (CatalogWebService.asmx) |
| GetCountries | GetCountryList |
| GetFundingSourceIDs<br>GetFundingSources | GetFundingSourceList |
| GetGenomicInfo<br>GetGenomicInfoIDs | GetGenomicManipulationList |
| GetInstitutionNames | GetInstitutionList |
| GetResearchAreaIDs<br>GetResearchAreas | GetResearchAreaList |
| GetSexValues<br>GetSexes | GetSexList |
| GetStates | GetStateAbbreviationList |
| GetTissueDistribution<br>GetTissueDistributionIDs | GetTissueDistributionList |
| GetTissueIDs<br>GetTissues | GetTitleList |

SHARED METHODS

* ALL LINKS POINT TO DEV *

MMPC
National Mouse Metabolic Phenotyping Centers

**Energy Expenditure Analysis :**

Karl Kaiyala, Charles Spiekerman , Robert Podolsky, Richard McIndoe

The MMPC Energy Expenditure analysis page uses multiple linear regression analysis to assess the impact of covariates (e.g. Mass) on energy expenditure.

File Types Accepted: comma separated (*.csv) or tab delimited format (*.txt).

Assumes: One EE variable (the response variable)
One Covariate (e.g. Mass)
One Grouping variable (e.g. Strain)

The file can include as many EE and covariates as you want but will only analyze one at a time.

Current version will not work if your grouping variable has more than two groups to analyze.

MMPC
National Mouse Metabolic Phenotyping Centers

Richard McIndoe

View Profile | Edit Profile

LOG OUT

## MMPC Energy Expenditure Analysis Page

The MMPC Energy Expenditure analysis page uses multiple linear regression analysis to assess the impact of covariates (e.g. Mass) on energy expenditure. Please note the data must be in either comma separated (*.csv) or tab delimited format (*.txt). The program expects to have at least one EE variable (the response variable), one Grouping variable (e.g. Strain) and one Covariate (e.g. Mass). The file can include as many covariates as you want but will only analyze one at a time. In addition, the current version will not work if your grouping variable has more than two groups to analyze.

**REFERENCES:**

Identification of Body Fat Mass as a Major Determinant of Metabolic Rate in Mice. Karl J. Kaiyala, Gregory J. Morton, Brian G. Leroux, Kayoko Ogimoto, Brent Wisse and Michael W. Schwartz. Diabetes 2010 59:1657-1666

Toward a More Complete (and Less Controversial) Understanding of Energy Expenditure and Its Role in Obesity Pathogenesis Karl J. Kaiyala and Michael W. Schwartz. Diabetes 2011 60:17-23

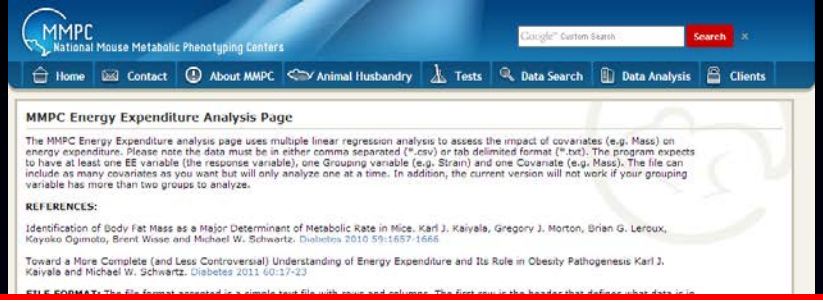
**FILE FORMAT:** The file format accepted is a simple text file with rows and columns. The first row is the header that defines what data is in each column and all following rows are the data for each animal. Columns can be separated by either a comma (,) or a tab. Comma separated formats expect a file extension of .CSV while tab delimited files should have a file extension of .TXT. In MS Excel, you can 'Save As' a comma or tab separated file to generate a text file.
You can run an example of an intereaction between covariate and EE here and an example of no interaction between covariate and EE here.

Please browse to the Energy Expenditure file you would like to analyze and click submit:

Choose File No file chosen

Submit

Back to Top




Please select the Grouping Variable (e.g. Strain), the Energy Expenditure or Response Variable and the Covariate Variable (e.g. Mass).
You can also adjust the threshold P value for significance of the interaction.
When you have selected the appropriate variables, select Run Regression.

Significance Threshold P value 0.05

| Grouping Variable | EE Variable | CoVariate Variable |
|---|---|---|
| group | 24hEE | [None Selected] |

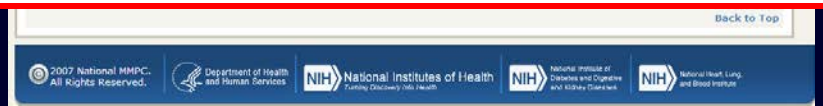
Enter Covariate Value to Test (optional)

[None Selected]
group
fatmass
leanmass
totalmass
percentfat
darkEE
lightEE
24hEE

Run Regression

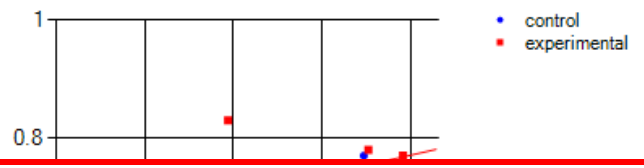
Download Result

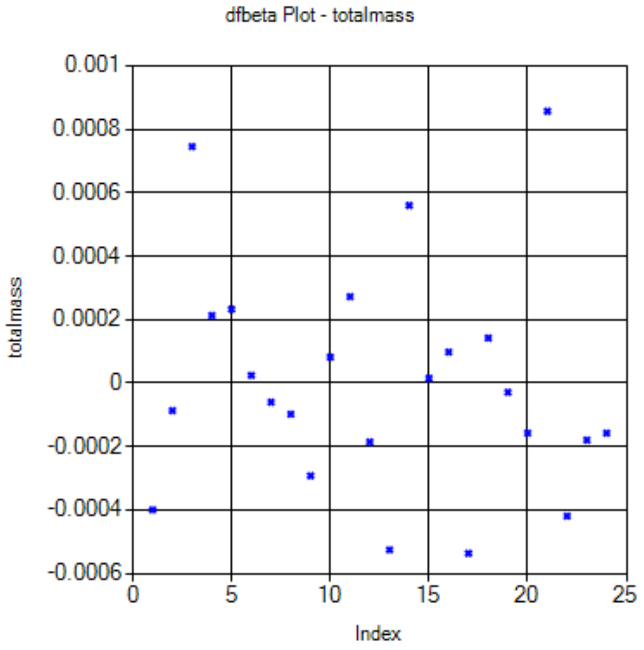
```
experimental,13.78,21.51,37.19,37.06,0.74,0.64,0.69
control,17.83,22.04,40.76,43.74,0.79,0.63,0.71
control,20.76,21.36,43.36,47.89,0.82,0.67,0.74
control,13.48,21.82,36.90,36.54,0.68,0.58,0.63
control,17.99,21.94,40.60,44.30,0.69,0.59,0.64
control,14.15,24.02,39.29,36.00,0.88,0.66,0.77
control,9.58,21.21,31.80,30.10,0.71,0.55,0.63
control,12.75,21.78,35.92,35.50,0.77,0.64,0.70
control,17.98,21.86,41.33,43.50,0.71,0.60,0.65
control,10.84,15.90,28.01,38.71,0.64,0.54,0.59
control,9.94,17.57,28.23,35.21,0.70,0.54,0.62
control,8.41,17.71,27.17,30.97,0.67,0.58,0.63
control,6.07,17.14,24.34,24.92,0.57,0.44,0.51
control,6.99,17.46,26.11,26.80,0.69,0.60,0.65
control,10.35,17.00,28.51,36.30,0.68,0.63,0.65
control,6.92,17.64,26.20,26.40,0.66,0.57,0.62
```

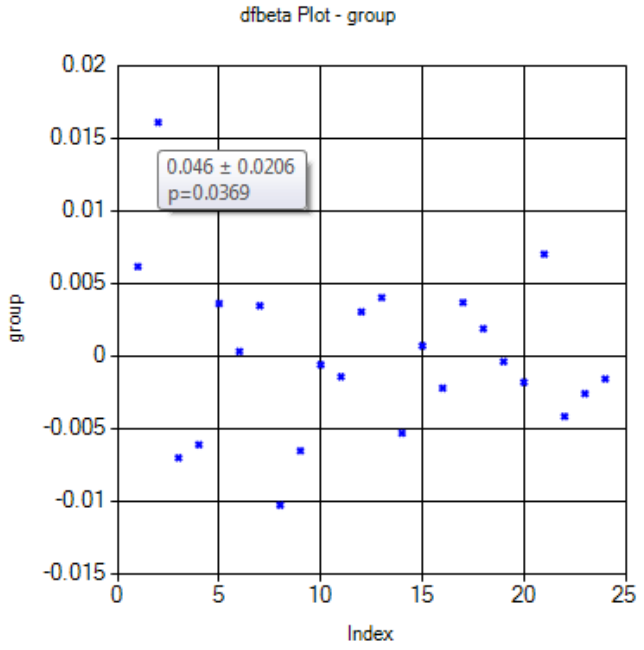



MMPC National Mouse Metabolic Phenotyping Centers

| |
|---|
| Program= MMPC Multiple Linear Regression Output |
| Datafile=EE_mass_dataset1.csv |
| Response Variable=24hEE |
| Covariate=totalmass |
| Grouping Variable=group |

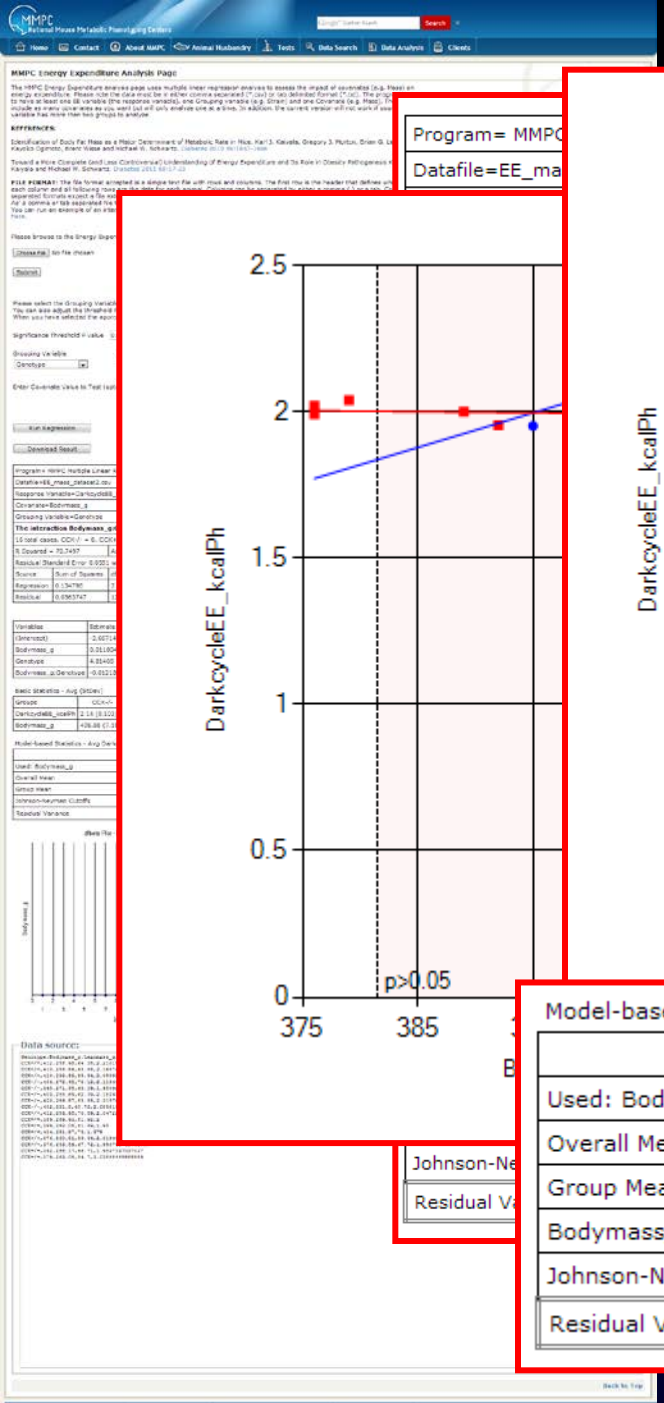



| | Groups | | |
|---|---|---|---|
| Used: totalmass | control | experimental | P value |
| Overall Mean | 0.65 (0.014) | 0.71 (0.018) | 0.01386 |
| Group Mean | 0.65 (0.014) | 0.7 (0.018) | 0.02625 |
| Residual Variance | 0.00212 | 0.00501 | |

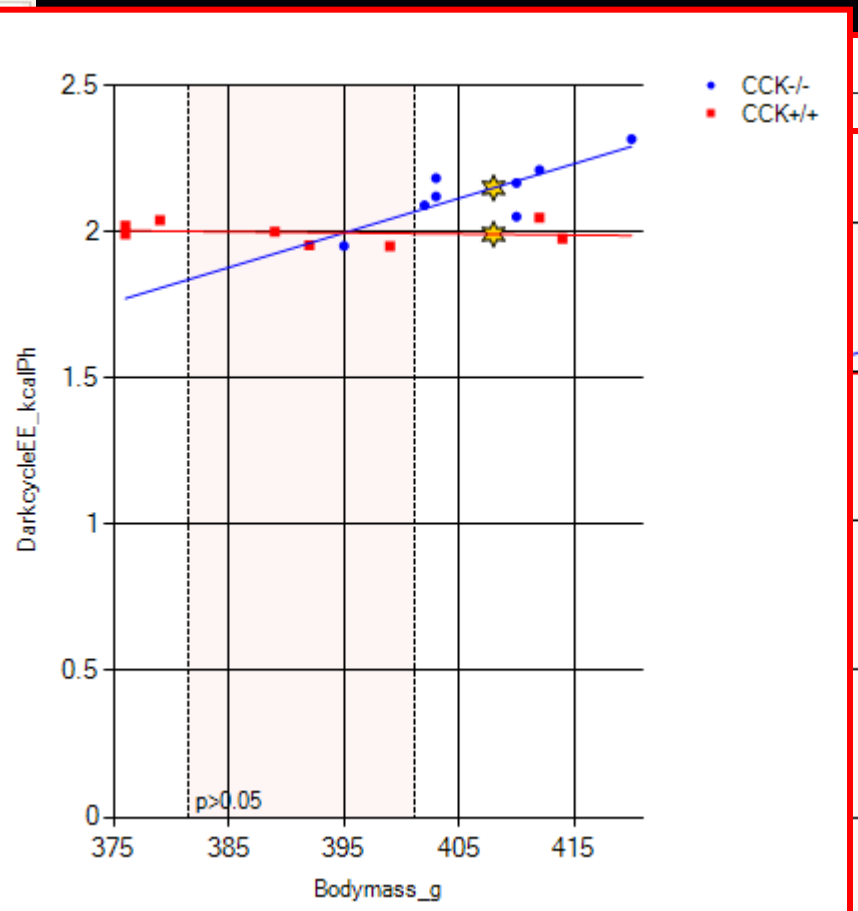
MMPC
National Mouse Metabolic Phenotyping Centers

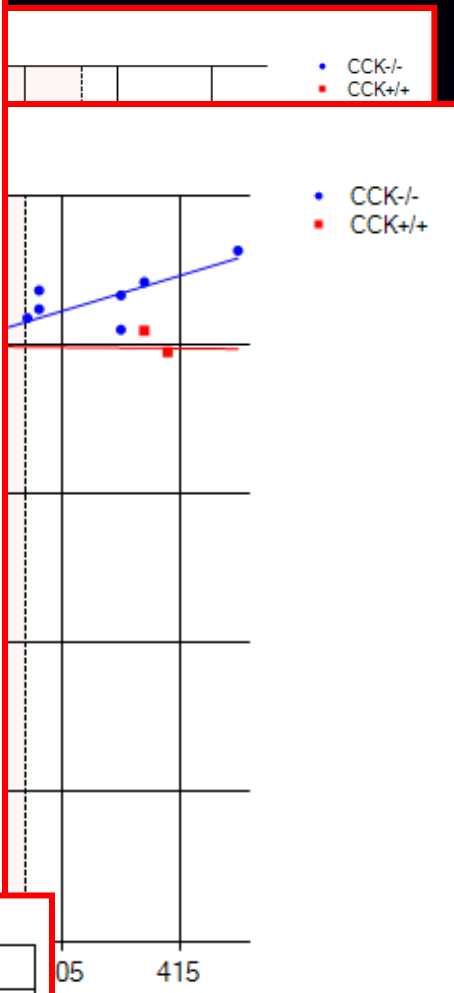



Program= MMPC

Datafile=EE_ma




Model-based Statistics - Avg DarkcycleEE_kcalPh (StErr)

| | Groups | | |
|---|---|---|---|
| Used: Bodymass_g | CCK-/- | CCK+/+ | P value |
| Overall Mean | 2.05 (0.028) | 1.99 (0.022) | 0.1502 |
| Group Mean | 2.14 (0.019) | 2 (0.019) | 0.0002877 |
| Bodymass_g=408 | 2.15 (0.02) | 1.99 (0.029) | 0.0007336 |
| Johnson-Neyman Cutoffs | <=381.6 , >=401.1 | | |
| Residual Variance | 0.00454 | 0.00153 | |

MMPC National Mouse Metabolic Phenotyping Centers

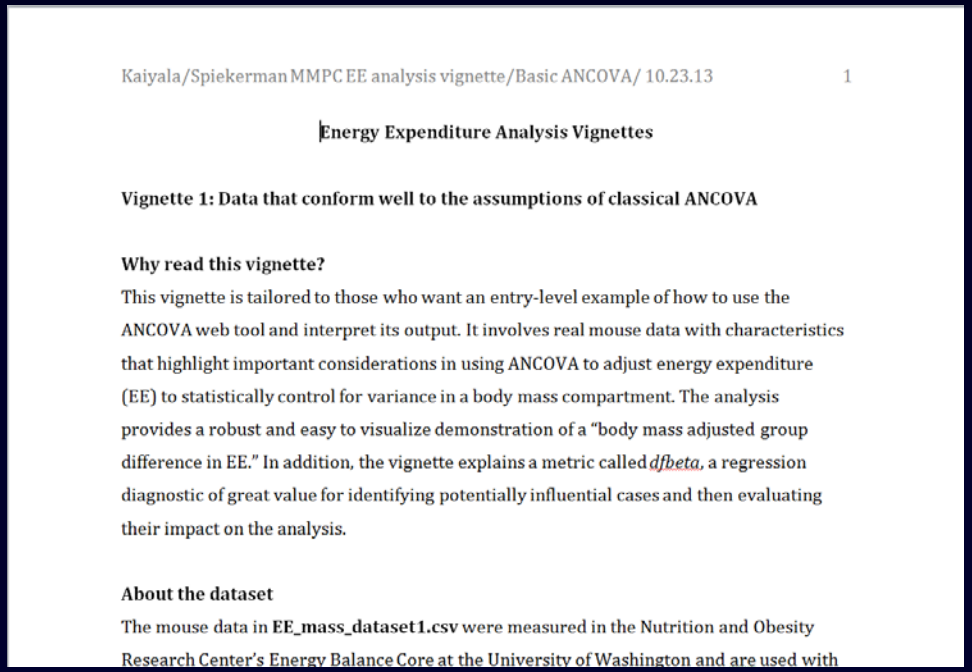
Vignettes: Written by Karl Kaiyala

Two vignettes will be available:

1. Based on real data that we have permission to use anonymously.

2. First vignette illustrates how to use the page when there is no interaction between the response variable and the covariate.

3. Second vignette illustrates how to use the page when there is an interaction between the response variable and the covariate.



Kaiyala/Spiekerman MMPC EE analysis vignette/Basic ANCOVA/ 10.23.13 1

**Energy Expenditure Analysis Vignettes**

**Vignette 1: Data that conform well to the assumptions of classical ANCOVA**

**Why read this vignette?**

This vignette is tailored to those who want an entry-level example of how to use the ANCOVA web tool and interpret its output. It involves real mouse data with characteristics that highlight important considerations in using ANCOVA to adjust energy expenditure (EE) to statistically control for variance in a body mass compartment. The analysis provides a robust and easy to visualize demonstration of a "body mass adjusted group difference in EE." In addition, the vignette explains a metric called *dfbeta*, a regression diagnostic of great value for identifying potentially influential cases and then evaluating their impact on the analysis.

**About the dataset**

The mouse data in **EE_mass_dataset1.csv** were measured in the Nutrition and Obesity Research Center's Energy Balance Core at the University of Washington and are used with

MMPC National Mouse Metabolic Phenotyping Centers

# The End

**If you have any problems, questions or concerns don't hesitate to email us.**
**Use any of the following addresses:**

**Data, assays, experiment help:**
**miaufiero@gru.edu (Michael Aufiero)**

**Data Curation**
**ssharma@gru.edu (Shruti Sharma, Ph.D.)**

**Administration**
**jhigdon@gru.edu (Joann Higdon)**

MMPC
National Mouse Metabolic Phenotyping Centers